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**Cold Atmospheric Plasma as an alternative therapy for cancer therapies** OLGA VOLOTSKOVA, TERESA HAWLEY, MARY ANN STEPP, MICHAEL KEIDAR, The George Washington University — CAP (cold atmospheric plasma) is a technology, which is based on quasi-neutral ionized gas (plasma at low temperatures), which is being evaluated as an alternative or addition to existing cancer therapies. A recent study shows that CAP treatment can cause a significant reduction in tumor size in vivo. Thus the purpose of this study is to begin to identify the mechanism by which cancer cells are killed by CAP, i.e. to identify the mechanism of CAP action. CAP induced a robust  $\sim 2$ -fold G2/M increase in two different types of cancer cells with different degrees of tumorigenicity. We hypothesize that the increased sensitivity of cancer cells to CAP treatment is caused by differences in the distribution of cancer cells and normal cells within the cell cycle. The expression of  $\gamma$ H2A.X (pSer139), an oxidative stress reporter indicating S-phase damage, is enhanced specifically within CAP treated cells in the S phase of the cell cycle together with significant decrease in EdU-signal of DNA-replicating cells. Our data suggest that more tumorigenic cancer cells are better susceptible to CAP treatment.

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